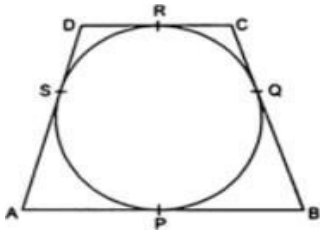
CLASS 10
TERM-II
PRELIMINARY EXAMINATION- II
Mathematics Standard (041)

Duration: 2Hrs. **Max. Marks: 40**

GENERAL INSTRUCTIONS:

1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
3. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
4. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study-based questions.

	SECTION A	
Q. N.		**Marks**
1.	If 7 times the seventh term of the AP is equal to 5 times the fifth term, thenfind the value of its 12^{th} term. OR Find the number of three digit natural numbers which are divisible by 7.	**2**
2.	Find the value(s) of k if the quadratic equation $3x^2-k\sqrt{3}x+4=0$ has real and equal roots.	**2**
3.	In a figure, a circle touches all the four sides of a quadrilateral ABCD whose sides are AB= 6 cm,BC=7 cm and CD= 4 cm.Find AD.  	**2**
4.	Two identical cubes each of volume 64 cm^3 are joined together end to end.What is the surface area of the resulting cuboid?	**2**

5. The mean of the following frequency distribution is 50 but the frequencies f_1 and f_2 in classes 20-40 and 60-80, respectively are not known. Find these frequencies, if the sum of all the frequencies is 120. **2**

6. If 2 is a root of the equation $x^2 + kx + 12 = 0$ and the equation $x^2 + kx + q = 0$ has equal roots, find the value of q . **2**

OR

Solve for x : $9x^2 - 6b^2x - (a^4 - b^4) = 0$

Section-B

7. Construct a pair of tangents to a circle of radius 4cm, which are inclined toeach other at an angle of 60°. **3**

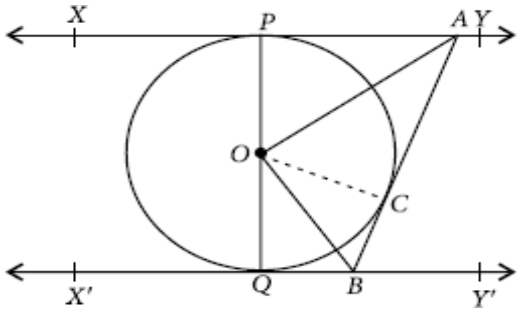
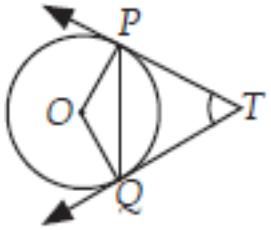
8. If the median of the distribution given below is 28.5,find the values of x andy. **3**

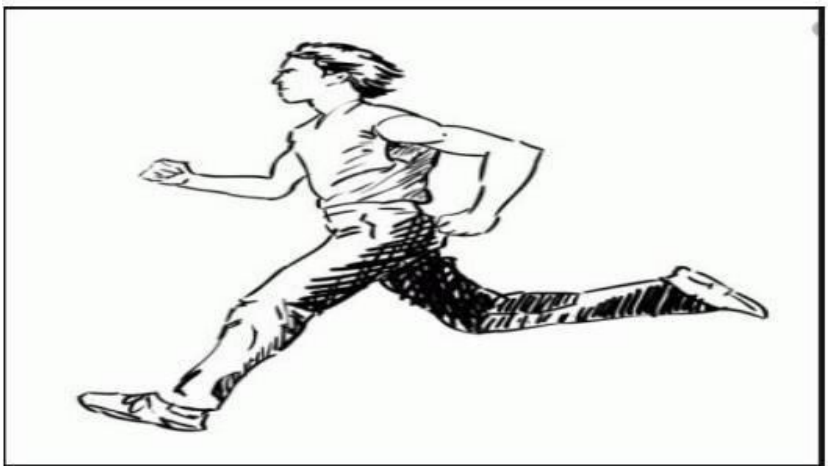
Class Interval	Frequency
0-10	5
10-20	x
20-30	20
30-40	15
40-50	Y
50-60	5
Total	60

9. Find the Mean of the following data using Assumed Mean Method **3**

% of Female teachers	No.of states/U.T.
15-25	6
25-35	11
35-45	7
45-55	4
55-65	4
65-75	2
75-85	1

10.	The internal and external radii of a spherical shell are 3cm and 5cm respectively. It is melted and recast into a solid cylinder of diameter 14cm, find the height of the cylinder. Also find the total surface area of the cylinder. (Take π = 22/7)	**3**
	Section-C	
11.	Two vertical poles of different heights are standing 20 m away from each other on the level ground. The angle of elevation of the top of the first pole from the foot of the second pole is 60° and angle of elevation of the top of the second pole from the foot of the first pole is 30°. Find the difference between the heights of two poles. (Take $\sqrt{3}$ = 1.73) **OR** A boy 1.7 m tall is standing on a horizontal ground, 50 m away from a building.The angle of elevation of the top of the building from his eye is 60°. Calculate the height of the building. (Take $\sqrt{3}$ = 1.73)	**4**

12.	In the given figure, XY and $X'Y'$ are two parallel tangents to a circle with centre O and another tangent AB with point of contact C, is intersecting XY at A and $X'Y'$ at B. Prove that $\angle AOB = 90°$.  **OR** In the given figure, PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the lengths of TP and TQ.  	**4**
13.	**CASE STUDY 1:** A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919.The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height. 	
13.1	They want to see the tower at an angle of 60 . So, they want to know the distance where they should stand and hence find the distance.	**2**

13.2	If the altitude of the Sun is at 60 , then the height of the vertical tower that will cast a shadow of length 20 m is	**2**
14	**CASE STUDY:2** Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less.He wants to do in 31 seconds **.**	
		
14.1	The value of x, for which 2x, x+ 10, 3x + 2 are three consecutive terms of an AP	**2**
14.2	What is the minimum number of days he needs to practice till his goal is achieved	**2**

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